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ABSTRACT

The purpose of this study was to determine the relationship among students' reports about their goal orientation, self-efficacy and self-regulated strategy, use and their academic performance in a Computer Literacy course as indicated by course grade. Also investigated were students' reports about their most preferred and utilized study techniques and the techniques they used to monitor their learning in this course. All participants in this study were students in a general studies Computer Literacy course at a large university in the southwestern United States. Three sets of analyses were conducted and results are organized accordingly. The first set consisted of multiple regression analyses examining the Motivated Strategies for Learning Questionnaire (MSLQ) responses and their relationship to course grade. In the second set of analyses, frequencies of responses and the thematic categories to the eight study-habit questions were determined. In the last set of analyses, the students' answers to the selected-response general course questions were analyzed and summarized. Results of this study portray a complex combination of the motivation and learning strategies utilized by college students in a Computer Literacy course. Overall, the results appear to indicate that these students held both extrinsic and intrinsic goal orientations at the same time. (Contains 27 references.) (AEF)

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By: Mary C. Niemczyk & Wilhelmina C. Savenye

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THE RELATIONSHIP OF STUDENT MOTIVATION AND SELF-REGULATED LEARNING STRATEGIES TO PERFORMANCE IN AN UNDERGRADUATE COMPUTER LITERACY COURSE

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Introduction

Recent research has shown that self-regulated learning is an important aspect of student academic performance in the classroom. Self-regulated learning can be defined as a student's use of specified strategies to achieve academic goals on the basis of self-efficacy perceptions. Students practicing self-regulation behaviors initiate and direct their own efforts to acquire knowledge and skill rather than relying on teachers, parents, or others. In general, self-regulated learning consists of three essential elements: commitment to academic goals, self-efficacy perceptions, and self-regulated learning strategies (Zimmerman, 1989).

Student academic goals are the underlying reasons or purposes for the students' learning behaviors. They represent the meaning that students assign to achievement situations. These goals provide a sort of cognitive organizational structure that encompasses how students define their successes and failures, affective reactions, and future behaviors (Urdan, 1997). Researchers on achievement motivation have found that different types of goal orientations elicit different motivational processes (Ames & Archer, 1988).

Academic goals are most often described as either mastery or performance goals. Students possessing mastery goals are considered to be intrinsically motivated, primarily focusing on learning or mastering the course material. Because they value the learning process itself, these students often seek out challenging assignments and put forth more effort to learn the material. They also tend to use more effective learning strategies while studying. In contrast, students with performance goals are considered to be extrinsically motivated. These students tend to focus on the outcome of their learning and are primarily interested in earning a good grade in the course, or gaining social esteem (Dweck, 1986; Pintrich 1995). Since they are mostly concerned with the reward that comes after they have learned the material, they tend to use less effective learning strategies. For students with performance goals, learning the material is often seen as a means to an end rather than an end in itself.

Although student goals provide direction and incentive for academic work, a second self-regulation element affecting student achievement is the students' beliefs about his or her ability. Belief in ones' ability to successfully perform a particular task is known as self-efficacy. Bandura (1986) stated that self-efficacy beliefs influence an individual's willingness to attempt a particular task, the level of effort he or she will employ, and his or her persistence in accomplishing the task. Self-efficacy is particularly important because of its two-fold effect on the other components of self-regulation. Not only does self-efficacy influence the type of goals students set for themselves but it also affects the amount of effort they invest in working toward these goals (Pintrich, 1995).

Previous research on self-efficacy has indicated that student behaviors can often be better predicted by their beliefs about their capabilities than by what they are actually capable of accomplishing. Results have shown that people's beliefs help determine what they do with the knowledge and skills that they have (Pajares & Miller, 1994). Typically, students with high-self efficacy are confident in their skills and abilities to do well and have been shown to participate more in learning activities, show greater effort and persistence, and achieve higher levels of academic performance than students with low self-efficacy (Pintrich & De Groot, 1990; Schunk, 1991). Even when experiencing difficulty, students with high self-efficacy tend to work longer and harder than do students with low self-efficacy. On the other hand, students with low self-efficacy frequently show less persistence and may attempt to avoid the learning situation altogether (Hagen & Weinstein, 1995). Lack of self-efficacy has also been coupled with the debilitating affect of high test-anxiety (Bandura, 1986).

A third element of self-regulation consists of student's learning strategies. Self-regulated learning strategies are the behaviors and actions students use to acquire desired information or skills. They include such methods as organizing and applying new information, self-monitoring one's performance, seeking assistance, and managing time and study environments (Pintrich, Smith, Garcia & McKeachie, 1991; Zimmerman, 1989; Zimmerman & Martinez-Pons, 1986). Students' use of self-regulated learning strategies depends not only on their knowledge of strategies but also on their academic goals and self-efficacy perceptions. Students with learning goals tend to use deep processing strategies that enhance their understanding of concepts. They attempt to integrate information and monitor their comprehension (Pintrich & Garcia, 1991). Conversely, students with performance goals, tend to use strategies that promote only short-term and surface level processing, like memorizing and rehearsing (Graham & Golan, 1991).

In much of the previous research on self-regulated learning, the focus has been on determining the foundational elements of the construct and the relationship between these elements. The results of this work have indicated that self-regulatory processes are linked with content domains, and individuals learn how to apply these skills in a given learning or applied context

(Zimmerman, 1998). Determining the specific self-regulatory processes associated with successful learning in particular content domains is an important next step in this line of research.

Computer Literacy courses are offered by many colleges and universities and are often taken by students from various academic majors. For many students, this course is a requirement of their degree programs. For others, the importance and applicability of the content information are influential factors in their desire to take the course. Very often, student enrollment in these courses may be as high as two- to three-hundred students per semester. Because Computer Literacy courses are so prevalent and the content a necessity to many college students, it is important to determine the relationship of motivation and learning strategies affecting learning and performance in these courses. It is also important to discover the various approaches and methodologies undergraduate students report they use to learn the course material.

The purpose of this study was to determine the relationship among students' reports about their goal orientation, self-efficacy and self-regulated strategy use and their academic performance in a Computer Literacy course as indicated by course grade. We also investigated students' reports about their most preferred and utilized study techniques and the techniques they used to monitor their learning in this course.

Method

Subjects

All participants in this study were students in a general studies Computer Literacy course at a large university in the southwest. Of the 291 participants, 193 were female and 98 male. The majority of the participants were education (27%), communication (18%), or broadcasting (11%) majors. In total, 26 different academic majors were represented. Four percent were freshman, 27% sophomores, 47% juniors, 21% seniors, and 1% graduate students. Students ranged in age from 18 years to 50 years, with an overall average age of 22.

Procedures

The Computer Literacy course was a multi-section course consisting of a lecture class and lab. The lecture portion of the course met in a large lecture hall twice a week for 50 minutes, while the lab section met in a PC computer lab once a week for a period of one hour and 50 minutes. In total, there were 17 lab sections for this course. Data were collected at the end of the fall 2000 semester during lab sections in which students were completing their semester final exam. In each lab section, the investigator described the survey, "Strategies Used for Learning in a Computer Literacy Course". Students completed the survey after finishing their final exam. Participation in the study was voluntary. Students were given two extra credit points toward their course grade for completing the survey.

Materials

The participants completed the survey "Strategies Used for Learning in a Computer Literacy Course". This survey consisted of three sections. The first section included demographic questions as well as selected response questions regarding the lowest grade they would be happy with in this course, and how many hours a week they study for this course. Participants were also asked to respond to a series of yes or no questions aimed at discovering their reasons for taking this course. Examples of these questions were, "The course is required for my major", "The content seems interesting", "It is an easy elective", and "It will improve my career prospects".

The second section of the survey included 73 motivation and learning strategies questions adopted from the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich et.al., 1991). The MSLQ is a self-report instrument designed to assess college students' motivational orientations and their use of different learning strategies. The motivation section of the MSLQ consists of six sub-scales with items designed to assess students' goals and value beliefs for a course, their beliefs about their skills to succeed in a course, and their anxiety about tests in a course. The learning strategy section consists of nine sub-scales with items regarding students' use of different cognitive and metacognitive strategies as well as management of various resources. Students rate themselves on a 7-point Likert scale (1 = not true of me, to 7 = very true of me).

The various sub-scales on the MSLQ can be used together or separately. Two learning strategy sub-scales, Rehearsal, and Help Seeking, were not used in this study due to the lower Cronbach alpha scores published by Pintrich et.al. (1991) for these scales (.69, and .52 respectively).

The third section of the survey consisted of eight questions, two selected-response and six open-ended, focusing on student study habits. The selected-response questions asked students if they study differently for this class than for their other classes and who is responsible for their success in learning, themselves or their instructor. The open-ended questions asked participants to describe two ways that they study for this class, two ways that they study for their other classes, how they check their understanding of the material while studying for this course, what is their major strength as a learner, what is their major weakness as a learner, and what they think would help them become better learners.

Data Analysis

Using the method developed by Pintrich et.al. (1991), the MSLQ sub-scale scores for each participant were constructed by taking the mean of the items that make up that scale. For example, intrinsic goal orientation has four items. An individual's score for intrinsic goal orientation was computed by summing the four items in the sub-scale and taking the average. There are some negatively worded items and the ratings were reversed before an individual's score was computed. The statistics reported

represent the positive wording of all the items. In general, a higher score of 4, 5, 6, or 7 for a sub-scale mean score indicates that the student feels the items were a fairly good representation of their motivational orientation or learning strategies used in this course.

Multiple regression analysis for two unordered sets of predictors was used to evaluate how well the use of specific motivation and learning strategies predicted course grade. The Holms Method was used to control for Type I error.

The responses to each open-ended question were analyzed and categorized by discernable themes. The number of responses in each thematic category was then calculated. Responses to the selected-response questions were compiled and summarized by frequency of occurrence.

Results

Three sets of analyses were conducted and results are organized accordingly. The first set consisted of multiple regression analyses examining the MSLQ responses and their relationship to course grade. In the second set of analyses, frequencies of responses and the thematic categories to the eight study-habit questions were determined. In the last set of analyses, the students' answers to the selected-response general course questions were analyzed and summarized.

Results from MSLQ Assessment of Student Motivational Orientations and Learning Strategies

Table 1 displays the means and standard deviations for course grade and scores on the MSLQ sub-scales. Significant sub-scale mean scores will be discussed along with mean scores for individual items on these sub-scales.

Table 1 Mean Scores and Standard Deviations on Course Grade and MSLQ Sub-scale Summaries

Variables		Mean	Standard Deviation
Course Grade		2.73	.98
Motivation Scales	Intrinsic Goal Orientation	4.62	1.10
	Extrinsic Goal Orientation	5.00	1.23
	Task Value	5.10	1.18
	Control of Learning Beliefs	5.18	1.06
	Self-Efficacy for Learning and Performance	5.32	1.07
	Test Anxiety	3.87	1.46
Learning Strategy Scales	Elaboration	4.21	1.16
	Organization	3.71	1.33
	Critical Thinking	3.49	1.24
	Metacognition	4.01	.94
	Time and Study Environment Management	4.31	1.10
	Effort Regulation	4.25	.85
	Peer Learning	3.06	1.52

Note: Sub-scale mean scores can range from 1 to 7.

The possible mean scores for the MSLQ sub-scales can range from one to seven. The selection of a one for an item on a sub-scale indicated that the student believed the item was not at all true of them, whereas a selection of seven indicated that the student believed the item was very true of them. The scores for all the individual items on the sub-scale were then averaged together to determine the mean score for the sub-scale.

The range of final course grades was from A through E. The numeric value associated with each grade was A = 4, B = 3, C = 2, D = 1, E = 0. Final course grades resulted in the following distribution: A= 65 (22%), B = 120 (42%), C = 75 (26%), D = 24 (8%), and E = 7 (2%).

Motivation Sub-scale Results

In response to the sub-scale items on the motivation scale, participants rated extrinsic goal orientation and self-efficacy fairly high, as indicated by the Extrinsic Goal Orientation and Self-Efficacy for Learning and Performance sub-scale mean scores. The mean score for the Extrinsic Goal Orientation sub-scale was 5.0 and Self-Efficacy for Learning and Performance was 5.3. Additionally, participants appear to not worry about course tests as indicated by a mean score of 3.8 on the Test Anxiety sub-scale.

Extrinsic goal orientation sub-scale results.

There were four items on the Extrinsic Goal Orientation sub-scale, with three items focusing on the importance of course grades and one item focusing on the approval of others. Mean response scores for each of the three items asking students to rate the importance of earning high course grades were fairly high, with each item mean score over 5.0. These items asked students to rate their satisfaction, value, and desire to earn a grade higher grade than their classmates. Based on the mean scores for each item, it appears that earning a good grade was a goal of many students.

The one item on the sub-scale focusing on the importance of earning a good grade in order to receive approval from others had a mean score of 4.3. The mean score is approximately at the midpoint of the scale range, indicating that for some students, earning a good grade was important in order to prove their ability to others.

Self-efficacy for learning and performance sub-scale results.

There were eight items on the Self-efficacy for Learning and Performance sub-scale, with five items focusing on the students' judgment about his or her ability to accomplish the tasks for the course, and three items focusing on the students' expectation for success in the course.

Mean response scores for the five items focusing on the students' beliefs about being able to accomplish the tasks for the course were positive and ranged from 4.7 to 6.1 on the seven-point scale. These items asked students to rate their beliefs in their ability to understand both basic and complex course material, and their confidence in performing well on course assignments and tests.

Mean response scores for each of the three items focusing on the students' expectancy for success were also very positive and ranged from 5.1 to 5.6. These items asked students to rate their beliefs on being able to earn an excellent grade, and their beliefs in their overall ability to do well in the course.

Test anxiety sub-scale results.

There were five items on the Test Anxiety sub-scale, with three items focusing on worry or negative thoughts during test taking and two items focusing on physiological arousal aspects of anxiety, such as upset feelings, and rapid heart beat

The mean response scores for the three items focusing on worry were approximately at the mid-point of the seven point scale, ranging from 3.2 to 4.2. These mean scores seem to indicate that for most students, they were not worrying about the possibility of a poor performance or even failure during test taking.

The mean response scores for the items focusing on the physiological aspects of anxiety were 3.6 and 4.2. These mid-range mean scores indicated that most students were not upset or did not have uneasy feelings during test taking.

Learning Strategy Scale Results

In response to the learning strategy items, participants rated elaboration fairly high and peer learning fairly low as indicated by the Elaboration and Peer Learning sub-scale mean scores. The mean score for the Elaboration sub-scale was 4.21 and Peer Learning was 3.06.

Elaboration sub-scale results.

There were six items on the Elaboration scale all focusing on study techniques that help students integrate and connect new information with prior knowledge. Mean response scores for these items ranged from a low mean score of 3.0 to a fairly high mean score of 5.0.

The mean response score for the item asking students whether they write brief summaries of course readings had a low score of 3.0, indicating that most students did not use this study technique. The remaining items on this sub-scale asked students if they try to connect the information learned in this course to prior knowledge or to other courses had higher scores of 4.2 to 5.0, indicating that many students used these methodologies when studying.

Peer learning sub-scale results.

There were three items on the Peer Learning scale all focusing on whether students worked with classmates to complete assignments or enhance their understanding of course content. Mean response scores for all three items were fairly low on the seven-point scale, ranging from 3.3 to 3.8. These low scores seem to indicate that students did not prefer to work with classmates in order to learn the course material.

Analyses to Determine Relationship Among Motivational Orientations, Learning Strategies, and Course Grade

Two multiple regression analyses were conducted to predict final course grade from students' self-reported motivation and use of learning strategies. One analysis included the six motivation strategies as predictors (intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy and test anxiety), while the second analysis included the seven learning strategies predictors (elaboration, organization, critical thinking, metacognition, environment regulation, effort regulation, and peer learning). For both analyses, the Holms Method was used to correct for Type I error. These two sets of predictors are unordered. The regression equation with the motivation strategies was significant, $R^2 = .14$, adjusted $R^2 = .12$, $F(6, 284) = 7.70$, $p < .001$. The regression equation with the learning strategies was also significant, $R^2 = .13$, adjusted $R^2 = .11$, $F(7, 283) = 6.27$, $p < .001$.

Indices indicating the relative strength of the individual predictors are presented in Table 2. Of the motivation components, extrinsic goal and self-efficacy were positively related to course grade, while test anxiety was negatively related to course grade. Of the learning strategies, elaboration was positively related to course grade and peer learning was negatively related to course grade.

Table 2 The Bivariate and Partial Correlations of the Predictors with Course Grade

Predictors		Correlation between each predictor and course grade	Correlation between each predictor and course grade controlling for all other predictors
Motivation Scales	Intrinsic Goal Orientation	.12	-.03
	Extrinsic Goal Orientation	.22 ***	.19
	Task Value	.09	-.05
	Control of Learning Beliefs	.09	-.04
	Self-Efficacy for Learning and Performance	.30 **	.17
	Test Anxiety	-.18 *	-.16
Learning Strategy Scales	Elaboration	.13 ***	.16
	Organization	.04	-.04
	Critical Thinking	-.07	-.15
	Metacognition	.11	.08
	Time and Study Environment Management	.22	.14
	Effort Regulation	-.03	.02
	Peer Learning	-.19****	-.21

* $p < .0125$, ** $p < .01$, *** $p < .008$, **** $p < .007$

Next, in order to determine moderating effects of one significant variable on another significant variable, we created five interaction terms. Development of the interaction term was based on both the statistical significance of each variable and conceptual importance. The five interaction terms were created by developing cross-products of the following variable combinations: self-efficacy and peer learning, extrinsic goal and peer learning, extrinsic goal and self-efficacy, extrinsic goal and test anxiety, self-efficacy and test anxiety. Of the five interaction terms, only two were significant.

The first interaction term created by the cross product of self-efficacy and peer learning was significantly related to course grade, $F(3, 287) = 14.09$, $p < .001$. Students who had high self-efficacy who collaborated with their peers were likely to have lower grades. In contrast, students with low self-efficacy who collaborated with peers were more likely to have higher grades.

The second interaction term created by the cross product of extrinsic goal and peer learning was also significantly related to course grade, $F(3,287) = 11.27$, $p < .001$. Students with high extrinsic goal orientation who collaborated with their peers were likely to have lower grades. In contrast, students with low extrinsic goal orientation who collaborated with their peers were likely to have higher grades.

Responses to Questions About Students' Study Habits

In addition to responding to the MSLQ items, students were also asked to respond to two selected-response questions and six open-ended questions focusing on their study habits. Their responses were analyzed by frequency of occurrence. Not all participants answered all of the questions in this section, possibly due to time constraints or simply lack of interest in responding. Because of this, the total number of responses for each question may not equal the total number of participants. Summaries of the responses are provided in Table 3. The responses for each question are listed in rank order of occurrence, beginning with the highest-ranking response. The numbers provided indicate the total responses. The percentages are based on the total number of responses for the particular question. Results of the analyses on the two-selected response questions will be presented first, and will then be followed by the results of the analyses on the six open-ended questions.

Table 3 Summary of Responses to Study Habit Questions

Do you study different-ly for this class than most of your other classes? (150)	As a student, who do you think is respon-sible for your success in learning? (150)	What methods do you use to study for this course? (222)	What methods do you use to study for your other courses? (200)	How do you check your under-standing of course material? (105)	What is your major strength as a learner? (108)	What is your major weakness as a learner? (77)	What would help you become a better learner? (97)
No 78 (52%)	I am 119 (79%)	Read text and notes 106 (48%)	Read text and notes 115 (57%)	Apply information 32 (30%)	Ability to memorize 26 (24%)	Procras-tinate, unmoti-vated, lazy 33 (43%)	Study schedule 23 (24%)
Yes 72 (48%)	My instructor 12 (8%)	Apply informa-tion 51 (23%)	Outline readings 31 (16%)	Quiz myself 29 (28%)	Visual learner 22 (20%)	Low attention span 28 (36%)	Disci-pline 23 (24%)
	Both 19 (13%)	Use course study guide 31 (10%)	Study with peers 21 (10%)	I don't 16 (15%)	Ability to compre-hend and under-stand 19 (18%)	Lack of time 10 (13%)	Hands-on, real world applica-tions 17 (18%)
		Use flashcards 17 (7%)	Use flashcards 20 (10%)	Make sure it is memo-rized 10 (10%)	Hands-on learner 18 (17%)	Not good in lectures 6 (8%)	More time 14 (14%)
		Study with peers 9 (4%)	Memo-rize material 9 (5%)	Discuss-ions with Teaching Assistants 10 (10%)	Persis-tence and dedica-tion 13 (12%)		Better study skills 11 (11%)
		Highlight text 8 (4%)	Attend class 4 (2%)	Discuss-ions with peers 8 (7%)	Quick learner 10 (9%)		Read more 9 (9%)

Note: Number of responses varies between questions because some participants did not provide responses while others provided multiple responses. Percentages based on total number of responses for each question.

Selected-response Question Results

The first selected-response question asked students if they studied differently for this Computer Literacy course than for their other courses. Students were to respond by circling either "Yes" or "No". Of the 150 participants responding to this question, 78, or 52%, circled "Yes", indicating that they studied differently, and seventy-two, or 48% circled "No", indicating that they studied the same way.

The second question asked students who they thought has responsibility for their success in learning. Students were to respond by circling "I am" or "My instructor is". Again, 150 students responded. The vast majority of the students, 119 or 79%, circled "I am" indicating that they are responsible. A small group of students, 12 or 8%, circled "My instructor" indicating that they feel the instructor is responsible for their success in learning, and 19, or13%, wrote in that both they and the instructor are responsible for their success in learning.

Open-ended Question Results

The first open-ended item in this section asked students to list two ways that they studied for the Computer Literacy course. Reading the text and notes was the most frequently-listed study technique, with 106 responses or 48%, followed by applying information learned in lecture to the lab class, with 51 responses, or 23%. Studying with peers was listed only 9 times, or 4%.

The second open-ended question asked students to list two ways that they studied for their other courses. Again, the most frequently-listed study technique mentioned by students was reading the text and notes, with 115 responses, or 56%. The next

most frequently occurring response was outlining readings, listed 31 times, or 15%. Studying with peers was listed 21 times, accounting for 10% of the responses.

The third open-ended question asked students to describe how they check their understanding of the Computer Literacy course material. The responses to this question indicated that there were two methods that most students used to check their understanding. Thirty-two students, or 30%, indicated that applying the lecture information by working on the computer helped them to determine their understanding of the material, 29 students, or 28%, stated that they quizzed themselves, and 16, or 15%, stated that they didn't check their understanding.

The fourth open-ended question asked students what they considered to be their strength as a learner. These results were mixed, with three characteristics being mentioned most often. In total, 108 students responded, with 26 participants, or 24%, indicated their ability to memorize was their strength. Twenty-two students, or 20%, stated that their strength was based on the fact that they were visual learners, and 19 students, or 18%, cited their ability to comprehend and understand.

The fifth open-question asked students what they considered to be their weakness as a learner. Most responses centered around two main themes, procrastination and low attention span. Of the seventy-seven students who responded to this question, 33 students, or 43%, indicating that procrastination, lack of motivation and laziness was their weakness, and 28, or 36% of students indicated that their weakness was due to their low attention span. Ten students, or 13%, indicated that they didn't have enough time to dedicate toward studying.

The final open-ended question asked participants what they thought would help them to become a better learner. From the responses, it appears that there are four factors students felt could possibly influence their learning. Of the 97 students that responded, 23, or 24%, indicated a study schedule would be helpful, and 23 indicated that they needed to be more disciplined. Seventeen students, or 18%, stated that they needed more hands-on, real world applications, and 14 students, or 14%, needed more time in their daily lives to dedicate toward school.

Responses to General Course Questions

Participants were also asked to respond to a series of selected response questions regarding the lowest grade they would be happy with, and how many hours a week they study for this course. They were also asked to respond yes or no to a series of nine items aimed at discovering their reasons for taking this course.

Lowest grade acceptable

Participants were asked to indicate the lowest course grade that would be acceptable to them, A, B, C, D, or E. For each participant, the actual grade earned was then compared to the lowest grade acceptable. Summary of the responses and the comparison between the lowest grade acceptable and actual grade earned are provided in Table 4.

Table 4 Comparison of Lowest Grade Acceptable to Actual Grade Earned

Lowest Grade Acceptable	Participants Indicating This as Lowest Grade Acceptable	Actual Grade Earned by Participants				
		A	B	C	D	E
A	78 (27%)	46 (59%)	23 (29%)	7 (9%)	2 (3%)	-
B	161 (55%)	17 (11%)	85 (53%)	43 (27%)	14 (8%)	2 (1%)
C	51 (18%)	2 (4%)	11 (21%)	25 (49%)	8 (16%)	5 (10%)

N = 290.

All participants wanted to earn a grade higher than C. In total, 156 students, or 54%, earned the grade they indicated would be the lowest grade acceptable, 104 students, or 36%, earned a grade lower than that which was acceptable, and 30 students, or 10%, earned a grade higher than their lowest grade acceptable.

Number of weekly study hours

Participants were also asked how many hours a week they study for this course. They were given five possible choices to select from; 0 hours, 1-3 hours, 4-6 hours, 7-8 hours, and more than 9 hours. Response totals and percentages are provided in Table 5.

Table 5 Reported Number of Study Hours per Week Dedicated to the Computer Literacy Course

Hours per week	Total Responses
0	40 (14%)
1 - 3	206 (71%)
4 - 6	37 (13%)
7-8	5 (2%)
9 or more	2 (1%)

N = 290

In general, 206 students, or 71%, indicated that they dedicated between one to three hours per week studying for this course and 37 students, or 13%, indicated that they dedicated four to six hours per week studying for this course. Forty students, or 14%, responded that they did not study at all for this course.

Reasons for enrolling the Computer Literacy course

The last question in this section of the survey asked students about the reasons they had for taking this course. They were asked to respond yes or no to a series of nine items aimed at discovering their purpose. They were to indicate all reasons that were applicable to them. Response totals and percentages are shown in Table 6.

Table 6 Reasons Students Enrolled in the Computer Literacy Course

Reason	Total Responses
Will be useful to me in other courses	248 (85%)
Required for academic major	233 (80%)
Will improve my academic skills	211 (73%)
Fit into my schedule	212 (73%)
Will improve my career prospects	205 (70%)
Content seems interesting	191 (66%)
Was recommended by my adviser	170 (58%)
Is an easy elective	106 (36%)
Was recommended by a friend	71 (24%)

The responses indicated that most students, 248 or 85%, thought this course would be helpful to them in other courses, and for 233 students, or 80%, this course was a requirement of their academic major. Many students, 211, or 73%, felt the course would improve their academic skills and 205 students, or 70%, felt the course would improve their career prospects. One-hundred ninety-one students, or 66%, took the course because they thought the content seemed interesting.

Discussion

The purpose of this study was to determine the relationship among student self-reports of their academic goal orientation, self-efficacy, self-regulated learning strategy use and their academic performance in a Computer Literacy course as indicated by course grade. Also investigated were students' most preferred and utilized study techniques and the methods they used to monitor their learning in this course.

The results of this study portray a complex combination of the motivation, and learning strategies utilized by college students in a Computer Literacy course. Overall, the results appear to indicate that these students held both extrinsic and intrinsic goal orientations at the same time. For many students, earning a high grade was very important to them, and many took the course because they thought the content would be valuable and interesting. These students also reported that they have both high self-efficacy and low test-anxiety, they utilize elaboration learning strategies and prefer to not study with their peers. Approximately half of the students earned the grade that they indicated was the lowest grade acceptable to them, but about one-third of the students earned a poorer grade than the lowest grade acceptable to them. The majority of students reported that they spent between one and three hours per week studying for this course, however, many indicated that more discipline and a study schedule would help them become better learners

In terms of achievement goals, findings in this study indicated that extrinsic goal orientation was positively related to course grade. This finding is similar to results from a previous study focusing on college students' goal orientations and use of self-regulation strategies in the classroom. In their study, Pintrich & Garcia (1991) found that having an extrinsic goal orientation,

such as a commitment to earning high grades, may actually help students focus not only on learning the course material, but also may assist them in maintaining their self-efficacy.

In the current study, self-efficacy was also positively related to course grade. From this finding, it appears that students had a combination of extrinsic goal orientation and high self-efficacy, which may have caused them to persist in their learning of the course material to achieve their desired academic goal. When individuals with either extrinsic or intrinsic goal orientation have high self-efficacy beliefs their behavior is quite similar (Miller, Behrens, Greene, & Newman, 1993). Individuals with high self-efficacy are confident in their ability to succeed at a task, tend to accept the challenge of the task and will persevere in an effort to successfully complete it.

Self-efficacy beliefs also influence the amount of stress and anxiety individuals experience as they engage in a task and the level of accomplishment they realize. In the current study, students reported high self-efficacy beliefs, therefore, it is not surprising that they also indicated they had low-test anxiety. Individuals with a strong sense of competence approach difficult tasks as challenges to be mastered rather than dangers to be avoided. Conversely, individuals with low self-efficacy beliefs may feel that things are tougher than they really are, a belief that fosters stress, depression and a narrow vision of how to solve a problem (Pajares, 1997).

Student selection of learning strategies used to accomplish a task is also dependent on both beliefs of goal orientation and self-efficacy. Results from previous studies have indicated that extrinsically motivated students tend to use short-term and surface-level processing strategies, such as memorizing and rehearsing strategies (Miller, et. al., 1993). Additionally, individuals with performance goals are less concerned with learning, and the use of learning strategies requires effort which implies a lack of ability, an inference that performance oriented students do not wish to make (Ames & Archer, 1988).

In the current study, the learning strategy of elaboration was positively related to course grade. Elaboration learning strategies are generally considered to be utilized by students with intrinsic goal orientations. For students that are intrinsically motivated, their goal is to learn the course material, therefore, learning strategies such as elaboration are often used to enable them to make new information more meaningful by connecting it with prior knowledge (Weinstein & Mayer, 1986). However, results from research by Pintrich and Garcia (1991) found that students with either intrinsic or extrinsic goal orientations both reported substantial use of cognitive and self-regulated learning strategies, such as elaboration and organization. It appears that a high level of concern for grades may actually lead to better cognitive engagement.

From earlier motivational research, it was generally believed that students have either a mastery or performance goal (Meece & Holt, 1993). Yet recent research on the relationship between mastery and performance goals has indicated that these two types of goals are independent of one another rather than opposite of one another. This independence means that it is possible, and perhaps even likely, for students to have both mastery and performance goals at the same time (Pintrich & Garcia, 1991).

Interestingly, results of the current study also indicated that students valued the information they were learning in the Computer Literacy course. Though intrinsic goal orientation was not significantly related to course grade, student responses to the items focusing on their reasons for taking the course indicated that a majority of students enrolled because they thought the course material was interesting. Students that enroll in courses because they find the content interesting or enjoyable are intrinsically motivated. They are taking the course for its inherent satisfaction rather than because it may lead to a separable outcome (Ryan & Deci, 2000). Based on these findings it appears the students in the Computer Literacy course had a combination of intrinsic and extrinsic goal orientations.

Though results of the current study appear to be consistent with the finding of Pintrich & Garcia (1991), it is also important to consider the course context in which the learning strategies were being used. In their responses on the Elaboration sub-scale items on the MSLQ portion of the survey, students in the current study indicated that they used information from lectures and readings to accomplish learning tasks and activities. The Computer Literacy course was comprised of a lecture and lab session, therefore, it is not surprising that students would use information learned in lecture to accomplish lab activities. These results seem to suggest that good strategy use in the classroom may be conditional and contextual to the learning situation, and may not be solely dependent on student goal orientation and self-efficacy beliefs. Future research may be necessary to further clarify these results.

Another characteristic of extrinsically motivated students is their desire to demonstrate their ability, or hide their perceived lack of ability. The fear of appearing incompetent can cause students to use behaviors that they feel might protect their sense of self-worth (Archer, 1994). Results of the current study indicated that peer learning was negatively related to course grade. This result is not surprising since students held high extrinsic goal orientations. A characteristic of many extrinsically motivated students is demonstrating competence to others. Because of this, perhaps these students did not want to appear incapable in front of others. When students pursue goals that concern maintaining a certain image in front of others, they interpret the need for help as a threat to self-worth. (Archer, 1994).

An interesting finding from the current study indicated that students with low self-efficacy beliefs that studied with classmates were likely to have higher grades. Comparatively, students with high self-efficacy that studied with classmates were likely to have lower grades. These results appear to be in contrast to previous research focusing on the effects of goal orientation and help seeking. Results from previous studies, found that students who had low self-efficacy beliefs were more likely to feel threatened when asking their peers for help and were more likely to avoid those types of activities. These students feel that their need for help indicates that they lack ability, therefore, they are less likely to seek assistance (Ryan & Pintrich ,1997; Ryan, Gheen, & Midgley, 1998).

Another interesting finding of the present study also indicated that students with high extrinsic goal orientation that studied with their classmates were likely to earn lower grades. Those students with low extrinsic goal orientation that studied with their classmates were likely to earn higher grades.

Also investigated in this study were the reported study techniques utilized by students in the Computer Literacy course, and what they felt would help them become more successful in their learning. It is interesting to find that approximately half of the students in this study indicated that they study the same way for this course as they do their other courses, and half stated that they study differently. The majority of students indicated that the study strategies they used in the Computer Literacy course were reading their textbook and lecture notes, then applying that information to computer activities. Most students also monitored their understanding of course material while trying to apply this information to the computer activities.

Results from previous research have indicated that use of various learning strategies may be conditional and contextualized. Students, therefore, need to understand the situations when certain learning strategies may be more or less effective (Pintrich & Garcia, 1994). When encountering a learning situation for the first time, students may not know how to think within that discipline. Pintrich (1995) suggests that in order for students to become successful self-regulated learners, teachers should help students become aware of how to think, learn, and reason within the particular discipline. Perhaps this would be beneficial for students in the Computer Literacy courses.

For many students in this course, it appears that learning techniques may need to be improved in order to promote more successful learning. There may possibly be variations to study strategies that could enhance learning in these types of courses. The majority of students indicated that they felt responsible for their success in learning, however, only half of them earned the grade that was the lowest grade acceptable to them, with many others earning a poorer grade. Students also indicated that they believed they could be more successful if they had a study schedule and more discipline. It may be beneficial, therefore, to provide students with appropriate strategies for learning the course material and assisting them in establishing suitable study schedules.

The results of this study highlight the motivation and learning strategies most related to course grade in a Computer Literacy course. This study not only provides information on students' learning goals and their use of self-regulated learning strategies, but it also gives insight to how undergraduate students view learning and the methodologies they use to study. The information provided from this study may assist teachers of undergraduate students in Computer Literacy courses, as well as other computer based courses.

Results of this investigation suggest several avenues for future research. First, measurements in the current study were gathered at only one point in time. It may be useful to replicate this study on a longitudinal basis to further examine the relationships between the motivation and learning strategies that prove to be most effective. Second, it would also be beneficial to look further into the interactions of the significant variables to determine the interplay and influence they may have on student learning and performance. Third, in this study, student self-report measures were used. It would be informative to use other data gathering measures such as interviews and observations. Finally, additional research may be needed to determine how classroom context and structures impact the motivational and learning strategies used by students.

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